

### Abstract of the Disclosure

A radiological imaging apparatus of the present invention comprises an image pickup device and a medical examinee holding device that is provided with a bed. The image pickup device includes a large number of radiation detectors and radiation detector support plates. A large number of radiation detectors are mounted around the circumference of a through-hole and arranged in the axial direction of the through-hole. The radiation detectors are arranged in three layers formed radially with respect to the center of the through-hole and mounted on the lateral surfaces of the radiation detector support plates. Since the radiation detectors are not only arranged in the axial direction and circumferential direction of the through-hole but also arrayed in the radial direction, it is possible to obtain accurate information about a  $\gamma$ -ray arrival position in the radial direction of the through-hole (the positional information about a radiation detector from which a  $\gamma$ -ray image pickup signal is output). The use of accurate information about  $\gamma$ -ray arrival increases the tomogram accuracy. As a result, the present invention enhances the tomogram accuracy, that is, the PET examination accuracy.